

## **CHANGES IN CRI ECONOMICS REPORT FROM DRAFT TO FINAL REPORT**

Executive Summary has been modified to incorporate and reflect the changes described below for Chapter 1 – 12.

### I. CHAPTER 1

1. Text corrected to account for confusion regarding groundwater (GW) and surface water (SW) interruptible rights. The correct numbers are 122 KAF of SW rights and 50 KAF of GW rights are interruptible. These data are detailed in Table 2.3.
2. Changed all summary numbers to conform to changes listed below in individual chapters.
3. Added a paragraph outlining the limitations to the economics study.

### II. CHAPTER 2

1. Combined the old Tables 2.1 and 2.8 to better described the 5 scenarios.
2. Combined old Tables 2.2 and 2.4 to simplify the presentation and corrected the estimated maximum total fee collections to reflect fees for conversion of interruptible SW rights..
3. Added a Section D. on Water Efficiency Standards (Best Management Practices).
4. The major change to chapter 2 involves modifications in the extrapolation of water rights from the existing application pool to the postulated total new rights under the various management Scenarios. The new Tables identify M&I water versus irrigation water, and separates CBP from other irrigation water rights. Text throughout the chapter was modified to reflect these changes.
  - a. Assume M&I is a priority in use. Allow for a 30% increase as reflecting population/economic growth. Current applications in the Tri-Cities account for a 28.5% increase. The remaining 1.5% will be made up by future rights. Also, 5% of CBP's 220 KAF will be used for M&I (pers. comm. Shannon McDaniel). The amount of water allocated to M&I use remains fixed across all scenarios.
  - b. For irrigation, assume that future rights will be distributed as existing applications for irrigation only. This differs from the original extrapolation that follows the distribution of all existing rights (both M&I and irrigation). Note that Grand Coulee's extrapolation also includes the remaining 209 KAF to CBP.
  - c. For the extrapolation by county, the same assumptions were made. The CBP consists of 3 counties: Adams, Franklin and Grant, and the distribution of the 209 KAF was given (by pers comm. Dick Erickson). Distribution of M&I rights across the 3 counties are unknown.
  - d. As a result of these modifications the resulting lower bound for scenario 3 increased from 568 KAF to 572 KAF.

### III. CHAPTER 3. AGRICULTURE.

1. Text changed to include a discussion of issues related to the analysis, including: data sources; market saturation of high value crops; conveyance and irrigation efficiency; the difference between actual water right use and paper right; conversion of interruptible water rights; new CBP water right replacing current groundwater use; and potential acreage constraints.
2. Text changed to include small sensitivity analysis of critical variables, including: market saturation of high value crops; conveyance and irrigation efficiency; and the difference between actual water right use and paper right.
3. Added discussion and tables of \$/AF values. New tables are 3.7 through 3.9.
4. Change table number to accommodate the new \$/AF tables.
5. Text added to clarify that the model used is not an optimization model and that it does not account for feedback effects between supply and demand.
6. Text added to discuss the composition of crop groups.
7. Text added and analysis changed to reflect that little of the new Columbia River water will be used to produce hay, other, or wheat crops in Klickitat County except for rotational needs.
8. Change and add text and analysis changed to reflect additional conveyance efficiency data.
9. Text added to clarify that the model used is not an optimization model and that it does not account for feedback effects between supply and demand.
10. Text added to clarify that the use of BMPs for additional water rights applies to both new and existing water users.
11. Text added to reiterate that the scope of work and time frame of the analysis called for off-the-shelf data rather than gathering new data.
12. Text added to reiterate that the scope of work and time frame of the analysis did not allow for an economic optimization model of irrigated agriculture.
13. Text added to clarify that the model used is not an optimization model and that it does not account for feedback effects between supply and demand.
14. Text added to describe the use of enterprise budgets.
15. Text added to discuss why prices from water transfers are not used as a basis for water value in the analysis.
16. Text added to discuss why hedonic price analysis of land value is not used as a basis for water value in the analysis.
17. Text added to discuss the use of average costs and prices rather than county level data due to its lack of availability.
18. Tables 3.22 and 3.23 were added to show the price and yield data used.
19. New price and yields
  - a. Gathered data from WASS 2003 Annual Bulletin
  - b. Old data was from crop budgets, wanted actual
  - c. Price data is a current value average of year 2000, 2001 and 2002 price per unit
  - d. Yield is an average of year 2000, 2001 and 2002 yields/acre
20. Put all crop values in year 2002 dollars to be consistent with the rest of the study
  - a. PPI from the BLS are used on costs figures
  - b. CPI from the BLS are used on prices
21. Text added to clarify the distinction between economic and accounting profits.

22. Tables 3.21 and 3.24 added to show enterprise budgets and the distinction between economic and accounting profits.
23. All tables were updated to include new analysis results from changes discussed above. The most significant changes include:
  - a. New data on conveyance efficiency resulted in a significant amount of new acreage. This data came from a recent CBP report and phone interviews. The draft had assumed 65-percent efficiency, the final version uses 81-percent in the CBP, 85-percent in the area above the CBP, and 99-percent in the area below the CBP.
  - b. Hops were moved from orchard to other. This resulted in a higher value of orchard crops.
  - c. More prices and yields were used to reflect a wider time frame.

#### IV. CHAPTER 4 MUNICIPAL AND INDUSTRIAL WATER SUPPLY CHANGES

1. Added more discussion of transactions throughout the Pacific NW, but improvements in finding values were not made.
2. More discussion of the marginal value of M&I water being highly dependent upon the water year.
3. Added estimated total value of new M&I water rights.

#### V. CHAPTER 5 (HYDROPOWER)

1. Incorporated changes in extrapolated water allocations across reservoirs as described in new Chap. 2 Tables 2.4, 2.6, and 2.8.
2. Incorporated more recent power price forecasts obtained from the Northwest Power and Conservation Council. These are produced by extensive simulations of future conditions using the Aurora model to track changes in technology, fuel prices, loads, and randomly selected water years. These newer price forecasts are for the years 2004-20024 and they are generally higher than the forecasts used in the Draft report.
3. Added the effects of converting interruptible water rights (122 KAF for irrigation) to non-interruptible rights. These are all irrigation water rights. The effect is to increase diversions in dry years (when these would otherwise be interrupted) and to increase slightly the hydropower costs in dry years.
4. Explicitly includes the effects of new M&I diversions. The previous version of Chap.5 simply assumed there would be very little effect due to the fact that consumptive use rates for M&I are very low. Here we added an analysis parallel to the one performed for irrigated agriculture, assuming 90% return flows from the new diversions at McNary and John Day pools, and assuming that return flows from new M&I diversions in the CBP would mimic those of irrigation return flows.
5. The overall change in hydropower costs from the November draft report is an increase the estimated hydropower costs by roughly \$9.8 million for the most costly estimate (for 1 MAF in dry years) and \$5.1 million for the lowest cost scenario (for 572 KAF in average water years). Most of this change is due to the higher forecasted power prices.

CHAPTER 6 -- Added a discussion of more summer diversions from irrigation resulting in more winter return flow and an added burden on flood control operations.

#### CHAPTER 7 – NAVIGATION

1. Reduced flow analysis adjusted to include converted rights and diversions for an upper bound on reduced flows.
2. Reduced flow analysis changed slightly to account for new extrapolation and M&I water rights in an identical fashion to that of Chapter 5. Tables 7.2, 7.8, and 7.9 changed.

CHAPTER 8 -- Section added on “Other Recreation” covering boating, camping, bird watching, etc. in the Lake Roosevelt and John Day reservoirs.

CHAPTER 9 – Estimated regional and secondary impacts were changed to be consistent with the changes in water rights allocations and changes in direct impacts on agriculture (Chap 3) and hydropower (Chap 5). All changes occurred in Tables. No changes to text.

#### CHAPTER 10 -- PASSIVE USE.

Added some explanation of non-fish values & noted the absence of usable estimates of value for non-irrigated land. Added Figure 10.1 to illustrate use of value function derived from Layton, Brown and Plummer (1999).

#### CHAPTER 11 – WATER MARKETS

1. Changed the definition of water banking to be consistent with the definition Ecology uses.
2. Added a discussion of the Yakima River Basin 2001 Drought Water Bank

#### CHAPTER 12—SUMMARY AND CONCLUSIONS.

1. Changes reflect changes throughout the entire document.
2. Added a table summarizing water values per AF by use and scenario.
3. Added a paragraph outlining the limitations to the economics study.